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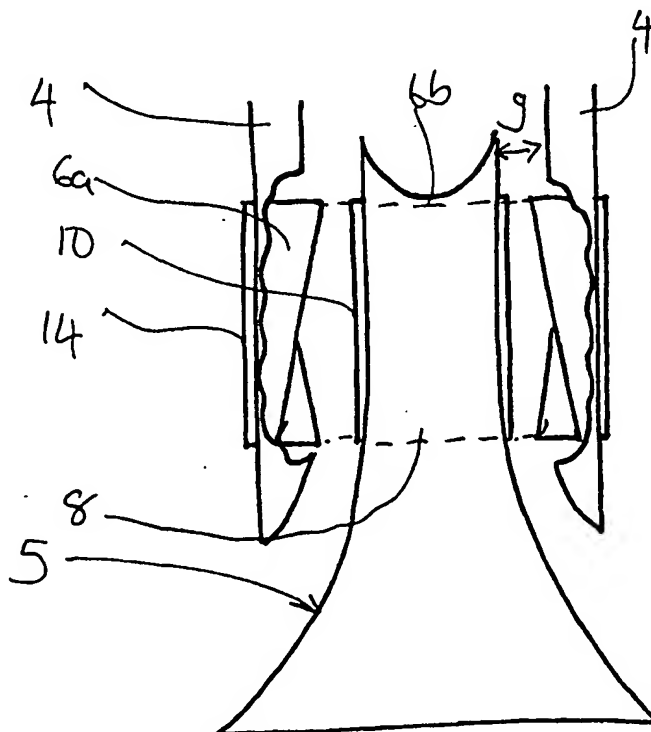
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

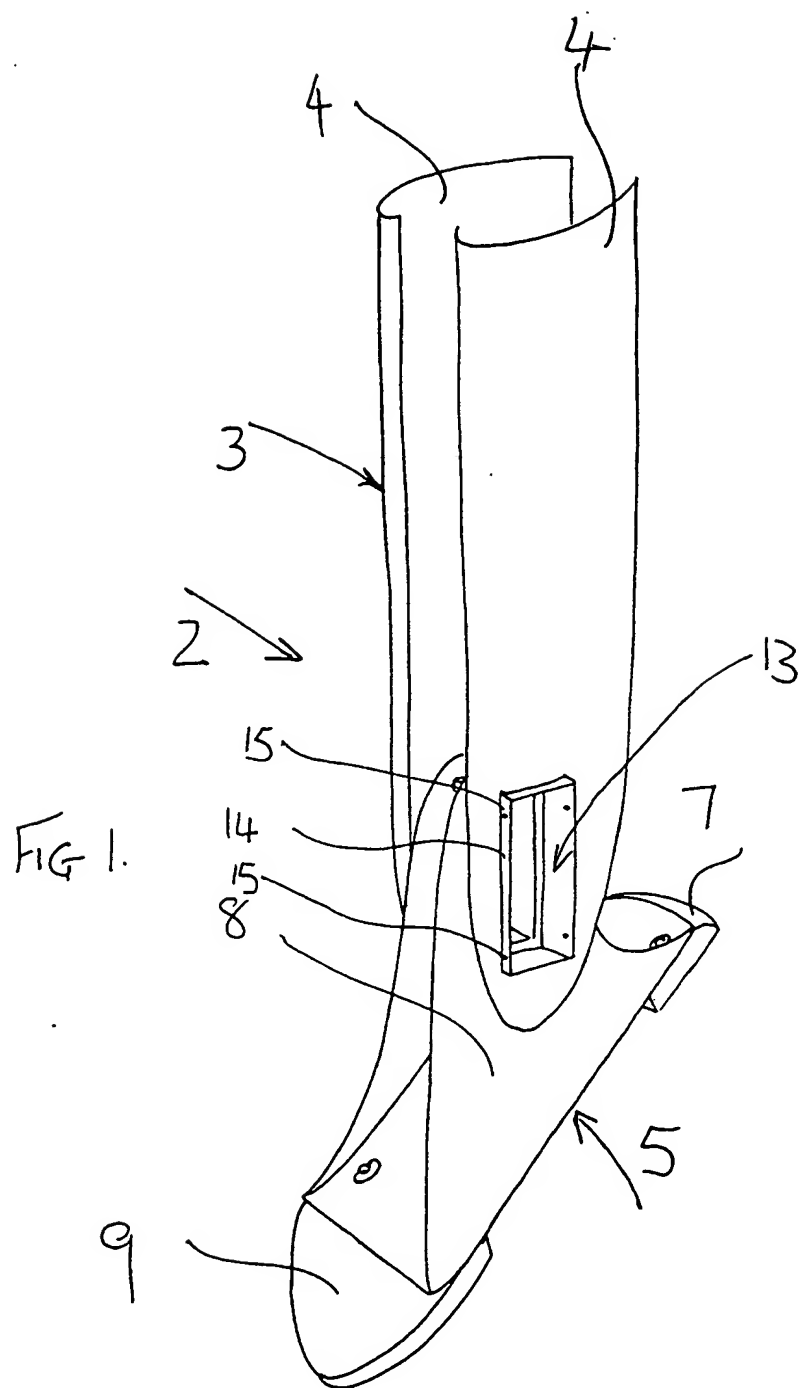
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<b>(21) International Application Number:</b> PCT/NZ99/00127 <b>(22) International Filing Date:</b> 11 August 1999 (11.08.99) <b>(30) Priority Data:</b> 331354 11 August 1998 (11.08.98) NZ <b>(71) Applicant (for all designated States except US):</b> BRITTEN PROTOTYPES LTD. [NZ/NZ]; 119 Worcester Boulevard, Christchurch 8001 (NZ). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> ALEXANDER, Wayne, Stuart [NZ/NZ]; 119 Worcester Boulevard, Christchurch 8001 (NZ). <b>(74) Agents:</b> LEWIS, Mardi, J. et al.; 65-67 Worcester Boulevard, P.O. Box 2201, Christchurch 8015 (NZ).		<b>(81) Designated States:</b> AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i>

**(54) Title:** PROSTHETIC ANKLE ELEMENT AND PROSTHESIS

**(57) Abstract**

A range of embodiments for an ankle element (6, 26, 46, 66, 86, 106, 126) for a prosthesis (2, 22, 42, 62) are provided. The prosthesis has two elements and the ankle element. The ankle element has at least a first portion (6b, 66b) connectable with a lower leg (4, 23, 44, 64) and a second portion (6a, 66a) connectable to the foot (6, 25, 45, 65). The ankle element provides a degree of rotational movement which is limited by the torsional energy absorbable by the material and shaping of the element. The element includes thrust and bearing surfaces, engage with shaped housings on the foot and leg element. Variations in the ease of rotation of the two elements relative to one another is obtained by a method selected from: the use of a centre piece (141) within the ankle element, which can be placed under compression; exchange of ankle elements of different density; and a combination of these.





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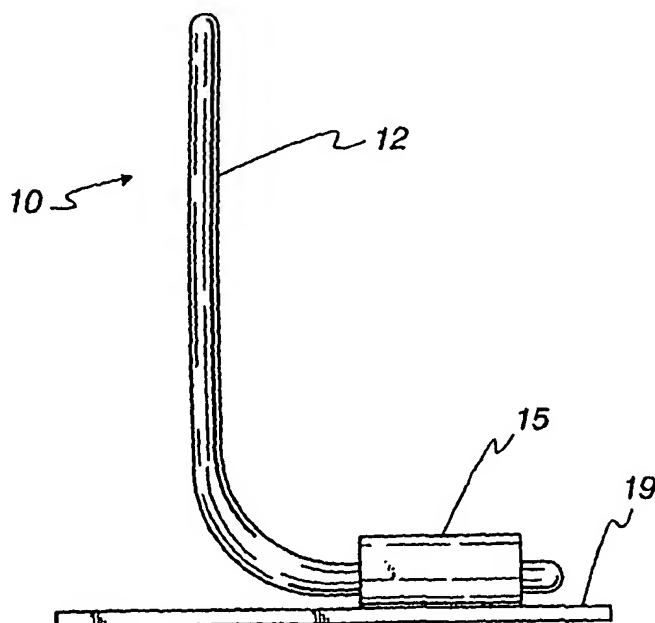
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**09/558,570** **26 April 2000 (26.04.2000)** **US**
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- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.
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(54) Title: **HIGH PROFILE MULTIAXIAL PROSTHETIC FOOT**



(57) Abstract: The present invention provides a prosthetic foot (10) that provides both energy storage capabilities and stability. The prosthetic foot (10) of the present invention provides medial-lateral rotation as compared to the slight tilting or rocking in the medial-lateral plane of the prior art devices. Furthermore, the prosthetic foot (10) of the present invention provides a true hinge in the ankle joint region that may be adapted so that the degree of rotation is controlled.

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**09/607,494 30 June 2000 (30.06.2000) US**

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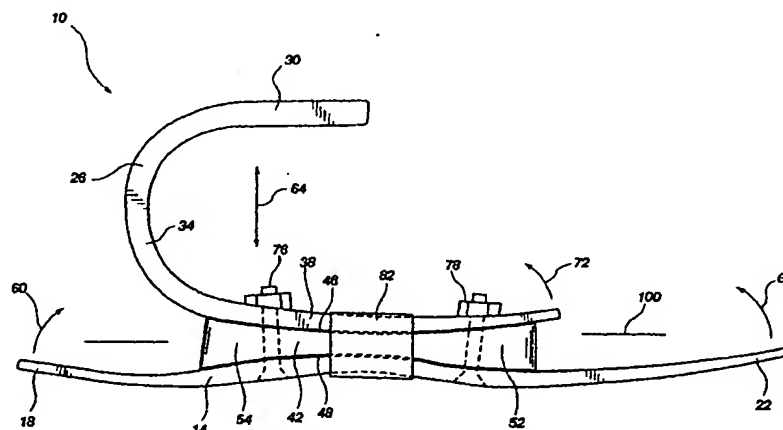
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(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **PROSTHETIC FOOT**



(57) Abstract: A prosthetic foot (10) includes an energy storing, upper foot member (16) movably coupled to and spaced above an energy storing, lower foot member (14). An energy transfer medium (42) is disposed between and separates the upper and lower members. The energy transfer medium has opposite, upper and lower contact surfaces (46, 48) along which the respective upper and lower members track during flexion. The energy transfer medium had a greater flexibility than the upper and lower members to allow the upper and lower members to move with respect to one another and flex, and to provide a cushion to soften the feel of the foot while allowing the upper and lower members to be stiffer. An adjustable fastener (76, 78) may couple the energy transfer medium and upper and lower members together, to selectively tighten and loosen the upper and lower members to adjust stiffness of the foot. Separate forward and rearward energy transfer mediums (154, 158) may be movably and selectively located along a longitudinal axis of the foot to adjust stiffness. The energy transfer medium may taper from the middle (90) to the lateral side (94, 96) to allow the upper and lower members to rotate about a longitudinal axis (100) of the foot to simulate ankle rotation.



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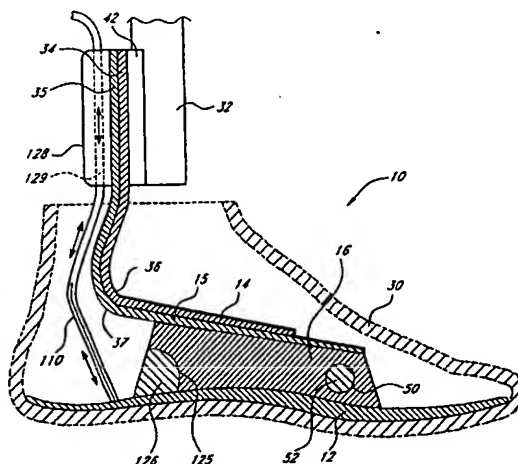
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09/698,489 26 October 2000 (26.10.2000) US
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- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, CZ (utility model), DE, DE (utility model), DK, DK (utility model), DM, DZ, EC, EE, EE (utility model), ES, FI, FI (utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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(54) Title: FOOT PROSTHESIS HAVING CUSHIONED ANKLE



(57) Abstract: A simple, inexpensive prosthetic foot is provided incorporating a cushioned ankle including an ankle block formed of a resilient material or bladder having desired compliance and energy return characteristics. The ankle block is sandwiched between a foot element and an ankle element. One or more openings extends through the ankle block with a substantially transverse orientation relative to a forward walking motion. The size and shape of these openings, as well as the insertion of different types of stiffeners therein, provide desired performance characteristics to the ankle block. When the ankle block takes the form of one or more inflatable bladders, the pressure within these bladders is individually controlled by valves to provide desired performance characteristics to different portions of the prosthetic foot. A pump system can also be used to control and generate fluid pressure into these bladders. A preferred pump system generates fluid pressure based upon the movement of the amputee onto two telescoping pylons that are connected to the prosthetic foot.

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